

US EPA ARCHIVE DOCUMENT

DATA EVALUATION REPORT

1. Chemical: Abamectin 2/13/1986
Sha. No.: 122804
2. Test Material: 8 α -Hydroxy Avermectin B_{1a} (Major soil metabolite of Avermectin B_{1a}.)
3. Study/Action Type: 48-Hour LC₅₀ with Daphnia magna
4. Study ID: Forbis, A.D.; Georgie, L.; Burgess, D. Acute Toxicity of 8 α -Hydroxy Avermectin B_{1a} to Daphnia magna. Analytical Bio-chemistry Laboratories, Study No. 33469, dated August 26, 1985. (Submitted by Merck, Sharp, and Dohme Research Laboratories.) Accession Number 074005
5. Reviewed by: Daniel Rieder
Wildlife Biologist
EEB/HED
Signature: *Daniel Rieder*
Date: 2/11/86
6. Approved by: Norm Cook
Section Head, Section 2
EEB/HED
Signature: *Norman Cook*
Date: 2-13-86
7. Conclusions:

This study is scientifically sound. LC₅₀ = 25.5 ppb
95% C.L. = 18 to 32 ppb. This study will fulfill the
Guideline requirement for an aquatic invertebrate LC₅₀ with
a soil degradate of Abamectin.
8. Recommendation: N/A
9. Background:

This study was submitted to support registration.
10. Discussion of Individual Tests: N/A
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11. Methods and Materials:

- a. Test Materials: 8 α -hydroxy Avermectin B_{1a}, a soil degradate.

Percent active ingredient: 99+ %

- b. Test Organism: Water flea

Species: Daphnia magna Age/Stage: < 24 hrs
Number per concentration: 20 Source: ABC Laboratory Stock

- c. Test Containers: Glass

Size: 250 mL Organisms per container: 10
Aerated: No Replicates: 2

- d. Test Conditions: Static

Photoperiod: 16 hours per day Measured concentrations: No
Temperature: 20 °C Test Solution: Aged wellwater

Controls: Solvent and Untreated

Solvent: Acetone

Protocol References: Committee on Methods for Toxicity
Tests With Aquatic Organisms.
Methods of Acute Toxicity Tests
with Fish, Macroinvertebrates and
Amphibians. (1975) U.S. EPA,
Ecol. Res. Serv. 660/3-75009.

American Public Health Association
(1980) Standard Methods for the
Examination of Water and Wastewater.
15th ed. Washington DC. 1134 p.

- e. Statistics:

Reference: Stephan, C.E.; Busch, K.A.;
Smith, R.; Burke, J.; and Andrews, R.W.
(1978) A Computer Program for
Calculating an LC₅₀. U.S. Environ-
mental Protection Agency, Duluth,
Minnesota, prepublication manuscript,
August 1978.

12. Reported Results:

48-hour LC₅₀ = 25.54 ppb 95% C.L. = 18 to 32 ppb.

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CONCENTRATION PPB Nominal	MORTALITY		CONDITIONS	
	24 hours	48 hours	DO	pH
Control	0	0	8.3	8.5
Solvent control	0	0		
3.2	0	0	8.0	8.6
5.6	0	0		
10	0	0	8.0	8.6
18	0	0		
32	0	18	7.8	8.6

13. Study Authors' Conclusions:

The 24-hour LC₅₀ is greater than 32 ppb. The 48-hour LC₅₀ is 25.5 ppb. The 48-hour NOEL is 3.2 ppb. Abnormal effects were observed at 5.6, 10, 18, and 32 ppb.

14. Reviewer Discussion:

- a. Methods/Procedure: The test procedure was acceptable.
- b. Statistics: The statistical results are compatible with the raw mortality data.
- c. Discussion/Results: 8 α -hydroxy Avermectin B_{1a} (a soil degradate of Avermectin) is very highly toxic to aquatic invertebrates.
- d. Adequacy: Core

15. Completion of One-liner: One-liner completed.16. CBI Appendix: N/A

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122804 Abamectin Degradate Daphnia magna LC50

CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB. (PERCENT)
32	20	18	90	2.012253E-02
18	20	0	0	9.536742E-05
10	20	0	0	9.536742E-05
5.6	20	0	0	9.536742E-05
3.2	20	0	0	9.536742E-05

THE BINOMIAL TEST SHOWS THAT 18 AND 32 CAN BE USED AS STATISTICALLY SOUND CONSERVATIVE 95 PERCENT CONFIDENCE LIMITS, BECAUSE THE ACTUAL CONFIDENCE LEVEL ASSOCIATED WITH THESE LIMITS IS GREATER THAN 95 PERCENT.

AN APPROXIMATE LC50 FOR THIS SET OF DATA IS 25.54447

WHEN THERE ARE LESS THAN TWO CONCENTRATIONS AT WHICH THE PERCENT DEAD IS BETWEEN 0 AND 100, NEITHER THE MOVING AVERAGE NOR THE PROBIT METHOD CAN GIVE ANY STATISTICALLY SOUND RESULTS.
